

REMARKS

The application has been reviewed in light of the Office Action mailed on January 4, 2005. Claims 2, 5 and 7 have been cancelled, and claims 1, 3, 4, 6, 8, 9, 11-13 and 15 have been amended without adding new matter. Claims 1, 3, 4, 6 and 8-17 are now pending in the application.

Claims 1-13, 15 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Pain et al., U.S. Patent No. 5,886,659 ("Pain") in view of Pickering et al., U.S. Patent No. 5,050,194 ("Pickering") and further in view of Gabara, U.S. Patent No. 5,739,714 ("Gabara"). Reconsideration is respectfully requested based on at least the following reasons.

Independent claims 1 and 15 have been amended to further distinguish the claimed invention over the combination of three references proposed by the Office Action. Amended claim 1 recites an image sensor comprising an "image processing portion ... having an output impedance; [and] an image receiving portion, having at least a pair of transistors and an input impedance." Amended claim 1 also recites an "active impedance matching device having a current source, said active impedance matching device being adapted to match said output impedance of said image processing portion to said input impedance of said image receiving portion by adjusting, with said current source, a bias current through said at least a pair of transistors." An example of this feature of the invention is illustrated and described in Figure 4 and page 6 of the specification, for example. The invention is not limited by the disclosed embodiments.

Pain, Pickering and Gabara, even if properly combinable, fail to teach or suggest these claim limitations. Pain does not disclose an active impedance matching device. Pickering discloses that "[t]he current is sourced by the transmission line matching impedances 6 situated at the receiver end of the link." See Pickering, Figure 1 and col. 2, ll. 48-50 (emphasis added). Thus, Pickering uses matched impedances 6 for transmission line matching, rather than by "adjusting, with said current source, a bias current through

said at least a pair of transistors,” as recited in amended claim 1. Gabara is relied on by the Office Action to disclose “active” impedance matching devices. Gabara discloses only “active impedance elements such as MOSFET’s,” and fails to teach or suggest the limitations of amended claim 1.

Further, as discussed above, claim 1 recites an “active impedance matching device ... adapted to match said output impedance of said image processing portion to said input impedance of said image receiving portion” (emphasis added). Thus, the claim recites an “image sensor” that matches impedances of an “image processing portion” and an “image receiving portion.” The benefits obtained by the claimed sensor are discussed, for example, on pages 1, 2 and 6 of the specification. The cited references, taken alone or in combination, fail to teach or suggest an “image sensor” that matches impedances of an “image processing portion” and an “image receiving portion.”

At least based on the above reasons, amended claim 1 is allowable over the cited references. Claims 2-6 and 9, 10, 12 and 13 depend from claim 1 and contain every limitation of claim 1. Claims 2-6 and 9, 10, 12 and 13 should be allowed based on the reasons for allowance of claim 1, and also because the unique combinations recited in these claims are neither taught nor suggested by the references. Claims 8 and 11 have been amended, and are discussed in more detail below.

Claim 15, as amended, recites an image sensor comprising an “image processing portion having at least a pair of transistors ...; and an impedance matching device having a current source, said impedance matching device being adapted to match an output impedance of said image acquisition portion to an input impedance of said image processing portion by adjusting bias current, from said current source, through said at least a pair of transistors.” As discussed above in connection with claim 1, the cited references, even if properly combinable, fail to teach or suggest all of the limitations of claim 15. For at least these reasons, amended claim 15, and claim 16 dependent therefrom, are allowable.

Moreover, the proposed combination of the three references is not proper under the requirements set forth in the MPEP. The Office Action admits that Pain does not disclose “an active impedance matching device being adapted to match said output impedance of said image processing portion to said input impedance of said image receiving portion.” Office Action, page 6. For these shortcomings, the Office Action initially relies on Pickering.

The Office Action asserts that because Pickering teaches differential input and output drivers 1, 8, and that “matching of the transmission line is also performed at the output of the drivers to minimize ... noise.” Office Action, page 6. The Office Action asserts that it would have been obvious to insert into Pain these teachings of Pickering. And, in the Response to Arguments section, the Office Action asserts that the “motivation taught by Pickering to minimize the effects of common-mode noise and reflection noise using CMOS differential driver and matching impedance of transmission line. ... Since both Pain and Pickering deal with digital data processing using CMOS technology and Pickering teaches what Pain is silent about, these references are substantially related to each other for a reasonable combination.” Office Action, page 3. However, the test is not whether the references are “substantially related,” but rather whether there is motivation to combine the references, and there is none.

Just because both references involve in some way CMOS technology does not mean that motivation exists to pick and choose elements from Pickering to substitute into Pain. Pain discloses a digital to analog converter (DAC) having a digital output. Nothing in Pain suggests that its output should, for some reason, have impedance matching with an input line of another source. Pickering discloses a data interface, for high speed asynchronous data transfer, for use in digital communication systems. Pickering does not suggest that its interface be installed on a DAC, and there is no suggestion or motivation in Pain to somehow add to its device the “matching of the transmission line” feature of Pickering’s device.

The Office Action simply provides a conclusion – that there is a motivation to minimize noise – which is not based on anything that is disclosed in the references or to what the references relate. Based on this conclusion, each and every disclosure ever made relating to reduction of noise in any kind of a circuit would be properly combinable regardless of the intended use of the structures or whether or not components of different disclosures could be functionally substituted into one another. The Federal Circuit was very clear in its intent to prevent such broad conclusions when stating that “motivation to combine prior art teachings ‘must be clear and particular ... Broad conclusory statements regarding the teachings of the multiple references ... are not evidence’” of motivation. In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999).

The already improper “combination” of Pain and Pickering is made even more improper by the proposed addition of a third reference – Gabara. The Office Action admits that Pickering fails to teach or suggest “an active impedance matching device” as recited in claim 1, and relies on Gabara for this shortcoming. The only motivation to make the additional substitution is that to “variably control (variable load) the impedance of the devices in the combination of Pain and Pickering as an obvious circuit design variation over the passive one.” Office Action, page 5.

This is another improper leap by the Office Action. The Office Action points to nothing in either Pain or Pickering that would suggest a need to “variably control (variable load) the impedance of the devices.” This is hindsight mixing and matching. Gabara relates to an apparatus “for controlling ground bounce.” There is simply no reason why a person skilled in the art of “current mode imaging devices” (of Pain) or “high speed asynchronous data interfaces” (of Pickering) would look to a disclosure relating to an “apparatus for controlling ground bounce” (of Gabara) to “variably control load,” as asserted by the Office Action. This proposed combination is improper, and in violation of the principles established in MPEP § 2143 and by the Federal Circuit.

Claims 8 and 11 have been amended to recite, in independent form, a sensor having a “current mode driver having an output voltage swing of less than 0.5 volts.” This

feature of the invention is discussed, for example, on page 6, lines 1-5 or the specification. The cited references, taken alone or in combination, fail to teach or suggest this limitation and the combination of limitations recited in claims 8 and 11.

Applicants acknowledge with appreciation the indication that claims 14 and 17 are allowed. In view of the above amendments and remarks, however, Applicants believe that all of the claims pending in the application are in condition for allowance.

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